KSC-SPEC-P-0012
April 25, 1979

REFRACTORY CONCRETE,
SPECIFICATION FOR

Approved:

Raymond L. Clark
Director of Design Engineering

JOHN F. KENNEDY SPACE CENTER, NASA

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3.0 REQUIREMENTS

3.1 Qualification. The refractory concrete furnished under this specification shall be a product that has been tested and has passed the qualification tests specified in 4.3, and has been listed or approved for listing on the approved products list.

3.2 Materials. The fine aggregate shall be hard, dense, durable, clean, sharp, and well graded.

3.3 Properties.

3.3.1 Fineness Modulus. When tested in accordance with 4.3.2, the fineness modulus shall be between 3.75 and 2.75.

3.3.2 Strength. When tested in accordance with 4.3.3, refractory concrete shall develop a compressive strength of 4500 psi (minimum) at 7 days and 90 percent of the 7-day strength within 24 hours. If desired to develop improved properties, use of randomly dispersed steel wire fibers shall be permitted provided steel fibers do not segregate and clog nozzles.

3.4 Stability. When maintained in the original unopened bag for a period of 1 year, the material shall meet the requirements of this specification.

3.5 Rocket Engine Exhaust Resistance. Test samples installed at designated areas of the launch facility and then subject to rocket engine exhaust, shall not crack, spall, or erode more than 1/8 inch when tested in accordance with 4.3.1.4. Heat flux will be up to 3300 Btu/ft^2-sec; time of exposure will be approximately 10 seconds.

3.6 Workability. The refractory concrete shall be capable of being applied pneumatically or manually (trowel) to a uniform, smooth finish.

3.7 Weathering. The material shall resist degradation of thermal protection characteristics due to seacoast atmosphere exposure.

4.0 QUALITY ASSURANCE PROVISIONS

4.1 Responsibility. Unless otherwise specified, the manufacturer is responsible for the performance of all inspection requirements specified herein. Except as otherwise specified, the manufacturer may utilize his own or any other inspection facilities and services acceptable to NASA. Inspection records of the examinations and tests shall be kept complete and available to the Government for a period of five years, unless otherwise specified in the contract or order. The Government reserves the right to perform any of the inspections set forth in the specification, where such inspections are deemed necessary, to ensure supplies and services conform to the prescribed requirements.

5.3 Palletization. When specified (see 6.2), shipping containers shall be palletized using standard wooden pallets.

5.4 Marking. In addition to any special marking required by the contract, or order, bags shall be marked in accordance with MIL-STD-129. Each bag shall display the following information.

a. Title, number, and date of this specification

b. Name of the product

c. Batch number

d. Manufacturer's name and address

e. Weight of contents

f. Date of manufacture

g. Toxic precautions

h. Necessary supplementary information to ensure safe and proper use of the material

5.5 Mixing and Application Instructions. Mixing and application instructions shall be included with each shipment.

6.0 NOTES

6.1 Intended Use. The refractory concrete is intended for use on the flame deflector and other areas of a launch complex to protect the facility from radiant heat and flame impingement effects of the rocket engine exhaust plume of a launch vehicle.

6.2 Ordering Data. Procurement documents should specify the following:

a. Title, number, and date of this specification

b. Number of 100-pound bags

c. Certification of Conformance (see 4.4)

d. Test Reports (see 4.5)

e. Palletization, if required (see 5.3)

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever; and the fact that the Government may

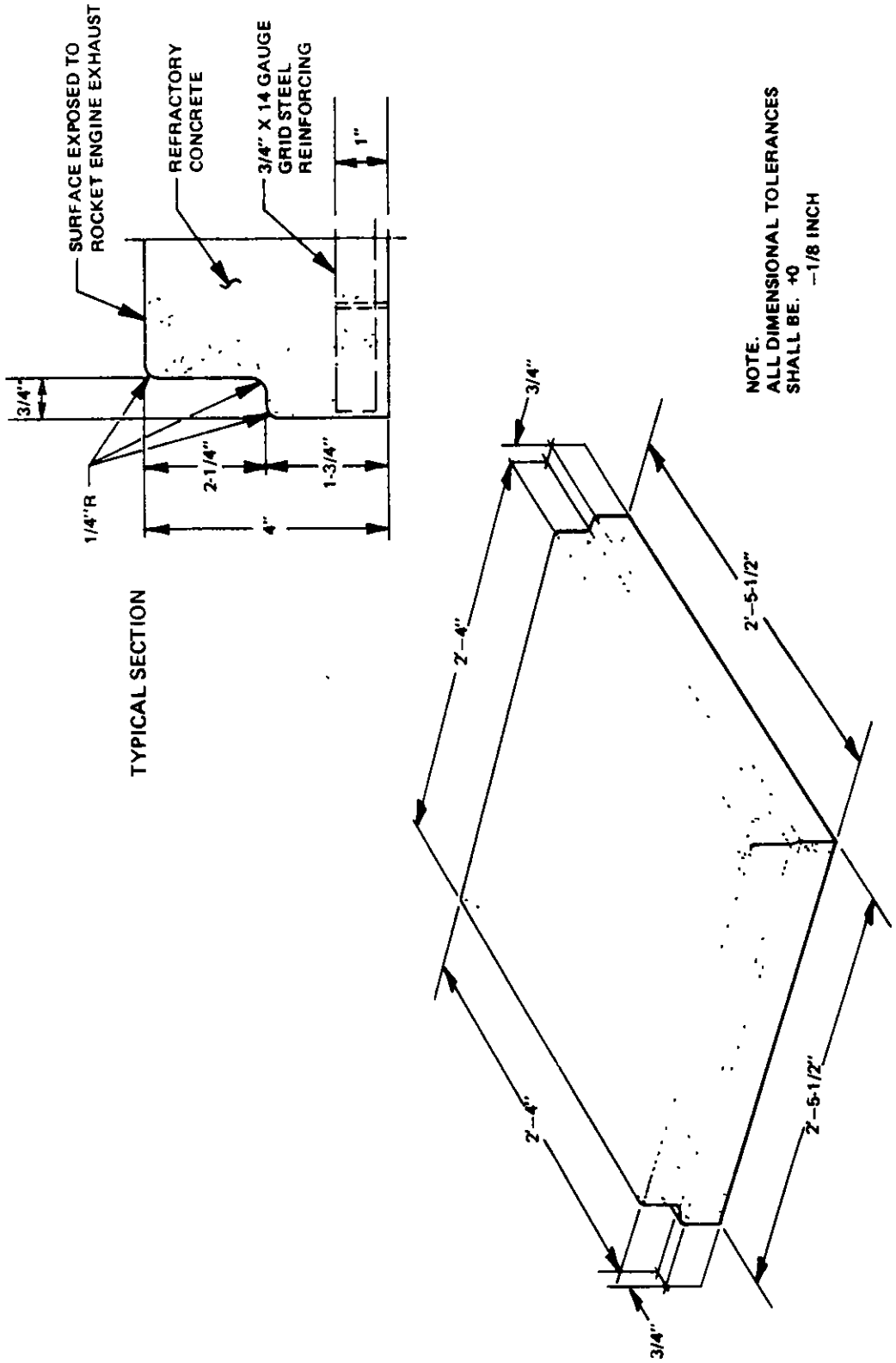

Figure 1. Test Sample Configuration